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(54) Title: PROCESS FOR REMOVING SULPHUR COMPOUNDS INCLUDING HYDROGEN SULPHIDE AND MERCAPTANS FROM GAS STREAMS

(57) Abstract: The invention concerns a process for the removal of hydrogen sulphide, mercaptans and optionally carbon dioxide and carbonyl sulphide from a gas stream comprising hydrogen sulphide, mercaptans and optionally carbon dioxide and carbonyl sulphide, by removing in a first step most of the hydrogen sulphide, part of the, mercaptans and optionally part or most of the carbon dioxide and carbonyl sulphide by washing the gas stream with an aqueous washing solution comprising 10 to 40 wt% based on total solution of water, 10 to 45 wt% based on total solution of a physical solvent and 20 to 60 wt% based on total solution of an amine, which first removal step is followed by a second removal step in which mercaptans are removed by means of molecular sieves, in which process the amount of mercaptans which is removed by the aqueous washing stream is between 60 and 96 wt% (of total removed mercaptans in steps one and two), and the amount which is removed by the mol sieves is between 40 and 4 wt% (of total removed mercaptans in step one and two).

WO 2004/047955 A1